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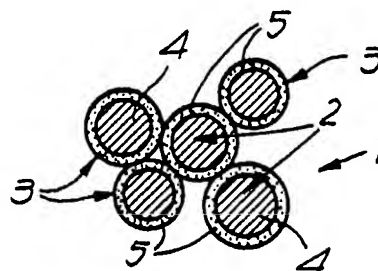
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(54) **Method for making a sealing and elements used to this end.**

(57) Method for making a sealing, in particular from a material on the basis of clay, characterized in that said material (2) is provided with a temporarily liquid-resistant coating (3).



*Fig. 1*

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The present invention concerns a method for making a sealing as well as elements used to this end.

It is known that for the dumping of waste, use is made of waste pits and such like. Hereby, it is necessary to take measures in order to prevent that the underlying soil becomes contaminated as the waste dissolves and penetrates into the soil.

A known technique consists in applying a watertight layer on the soil before dumping the waste. Usually, this layer is made of clay, in particular bentonite. The bentonite is hereby evenly spread over the soil to be sealed, either or not mixed with other products. After the thus formed layer has been sufficiently compressed and hydrated, a barrier impermeable to liquid is obtained.

The bentonite can be compressed by pressing it together mechanically with the help of special means, for example by riding over the formed layer with a flattening roller, or by applying a load, for example by dumping the waste on the formed layer, in both cases before the bentonite has been hydrated.

A sufficient mechanical compression can only be obtained with an optimum humidity level. On the other hand, an optimum compression through the application of a load is only possible when the bentonite or the mixture on the basis of bentonite is applied under entirely dry circumstances.

Thus, the application of such a watertight barrier can only take place either under entirely dry circumstances or under circumstances where the humidity level is under control.

The techniques known so far for sealing soils and such like water and/or gastightly by means of bentonite or by means of mixtures on the basis of bentonite do not make it possible to provide a sealing under wet and uncontrolled circumstances.

The present invention concerns a method for making a sealing which provides a solution to this problem, such that barriers can be formed and applied, not only in a dry environment or in an environment where the humidity is being controlled, but also under wet, uncontrolled circumstances or even in water.

To this end the invention concerns a method for making a sealing, in particular from a material on the basis of clay or bentonite, characterized in that said material is provided with a temporarily liquid-resistant coating, in other words a coating which is impermeable to liquid, but which disintegrates and/or dissolves after it has been exposed to it for a while.

In this way is obtained that when a sealing is made in a wet environment, the clay or the bentonite are not immediately hydrated, such that there is sufficient time left to compress said material with mechanical means or through a load and

thus make a water and/or gastight barrier.

The above-mentioned coating can be made of all sorts of materials depending on the application. Preferably, a material is used to this end which dissolves, disintegrates or breaks down in water after a certain period of time, such as for example cellulose, in a water-soluble form of course. It is clear that also other products can be used, possibly also a combination of different materials.

The present invention also concerns the elements used to realize said method. These elements mainly consist of an amount of material on the basis of clay or bentonite, either pure bentonite or bentonite mixed with other products, which is provided with a temporarily liquid-resistant coating. These elements can hereby be made in the shape of grains provided with a temporarily liquid-resistant film or in the shape of large amounts which are encapsulated together in a coating, or also in the shape of coated mats which are either or not reinforced. These grains can have various sizes and can be mixed in pre-determined proportions.

In order to better explain the characteristics of the invention, by way of example only and without being limitative in any way, the following preferred embodiments are described, with reference to the accompanying drawings, where:

figures 1 to 7 represent various embodiments of elements according to the invention;

figures 8 and 9 are schematic representations of how a sealing according to the invention can be made.

In order to make a sealing according to the invention, as shown in figures 1 to 7, use is made of elements 1 consisting of a material 2 on the basis of clay, for example bentonite, either pure bentonite or a mixture of bentonite with other products, whereby this material 2 according to the invention is provided with a temporarily liquid-resistant coating 3.

The embodiment of figure 1 is based on material 2 in the shape of small amounts, for example grains 4, which are individually provided with a coating 3 consisting of a film 5. This film 5 can for example be applied around the grains 4 by impregnating said grains 4 in liquid coating material and subsequently let this dry.

The coated grains 4 can be dumped on a soil to be sealed and be spread and compressed. This is possible on a dry or wet soil, and also in water. On a wet soil or in water, the coating 3 dissolves or disintegrates after a while under the influence of the water, such that the material 2, in particular the bentonite, is hydrated, and a watertight layer is formed. In the case of a dry soil, the coating 3 and the grains 4 must be specifically hydrated or moistened by adding water or another suitable liquid.

As shown in figure 2, the amounts of grains 4 can be bundled into one whole, with or without their coating 3, by applying them on a support 6, for example a fabric, a foil or such like, such that a mat is formed which can be either or not rolled up, and which can be rolled off on the spot where the sealing is made. This support may be provided on either one or two sides with a profile, for example for keeping the clay grains or the sand better in place. In this way, for example the shifting away of sand on slopes can be prevented. Hereby, supports 6 can be provided either on one or on both sides, and possibly also intermediate supports. These can be made of various materials.

The material 2, in this case the grains 4, with or without their coating 3, can be applied on the support or supports 6, by means of a chemical, physical and/or mechanical combination or link. This combination can be made for example through a temperature fluctuation such that there is adherence to the supports 6, or for example by piercing the supports 6 upon which or between which the material 2 can be found, such that there is a nailing so to say. During the piercing, fibres of the supports 6 penetrate into the material to be applied onto the supports, which results in an adherence.

As shown in figure 3, various amounts, for example grains 4, of the material 2 can also be simultaneously encapsulated in coating material 7. Figure 4 shows a variant of this whereby this encapsulation is carried out with a relatively thin layer, such that an element 1 is formed in the shape of a mat.

As shown in figure 5, said mat from figure 4 can also be provided with a support 6 or such like in order to reinforce the element 1.

As shown in figure 6, it is also possible to envelop a mass of grains 4 with a coating 3, consisting of a membrane 8 or such like, such that an element 1 in the form of a bag is formed. These bags can be put on the soil to be sealed, can be compressed and hydrated, whereby the membrane 8 disintegrates.

Of course, various combinations are possible for building up such elements 1. Figure 7 shows an example whereby a number of grains 4 have been provided with a double coating 3, on the one hand, a film 5 and, on the other hand, an encapsulation in coating material 7, whereby the material used for the film 5 and the encapsulation can be either or not of the same nature.

The coating 3 may consist of various materials. What is essential here is that the coating 3 consists of material, either in the form of a film, a membrane, a coating or such like, which is characterized in that it dissolves or breaks down after a certain period of time under the influence of liquid

and thus brings this liquid or another liquid into contact with the material 2 after a certain period of time, in particular with the bentonite, such that the bentonite can only be hydrated as of that moment on. Thus it is possible to make a sealing in a wet environment, or even in water. Of course, the coating 3 is made sufficiently thick so as to provide enough time to apply the material 2 on the soil and possibly compress it, either with mechanical means or through a load.

An example of coating material is cellulose.

It is clear that the bentonite, or the bentonite mixture, can also be treated, mixed with coating material respectively, such as for example a cellulose solution.

It is clear that the invention can be used for different purposes. In the first place, however, it is meant for the sealing of a soil upon which polluting products are to be dumped, such that the seeping through of the polluting materials into the underlying soil can be prevented. However, the invention can also be used to provide existing dumping sites and such like with a sealing top layer.

Figures 8 and 9 show an example of how such a sealing can be provided in for example a waste pit 9 which contains ground water 10 or such like. An element 1 according to the invention, in particular in the shape of a mat, is dropped in the waste pit 9 or rolled off in it as shown in figure 8. The element 1 is then pressed and compressed against the bottom 11 and the walls 12 of the waste pit 9. This can be performed in water. After a certain period of time, the coating 3 of the element 1 disintegrates and the clay of the element 1 is hydrated, which results in a watertight layer, such that, as shown in figure 9, the waste pit 9 can be used for the dumping of waste 13 or any other products which should not seep through in the soil 14.

Preferably, the material 2 consists of sodium bentonite or calcium bentonite, either or not mixed with other products. It is clear that also other materials can be used.

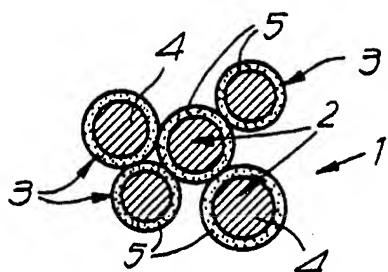
It is clear that the material 2 does not necessarily need to be composed of grains 4, but can also be used in other shapes in order to realize the invention.

It should also be noted that the different mats made in this way, in particular the supports described above, can be interconnected in any chemical or mechanical way whatsoever, for example through gluing, nailing, stitching or such like.

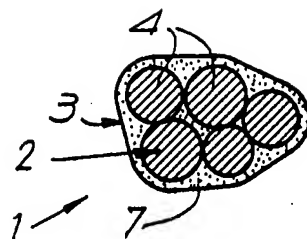
The present invention is in no way limited to the embodiments described by way of example and shown in the accompanying drawings; on the contrary, such a method and the elements used with it can be made in all sorts of variants while still remaining within the scope of the invention.

# Claims

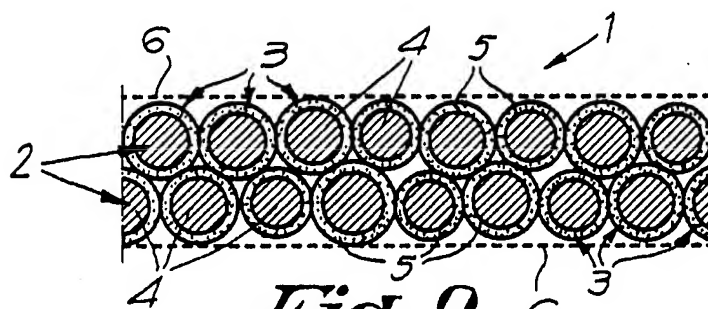
1. Method for making a sealing, in particular from a material on the basis of clay, characterized in that said material (2) is provided with a temporarily liquid-resistant coating (3). 5
2. Method according to claim 1, characterized in that for the coating (3) use is made of a material which breaks down or dissolves in water. 10
3. Method according to claim 1 or 2, characterized in that for the material (2) use is made of grains (4) which are individually coated by means of a film (5). 15
4. Method according to claim 1 or 2, characterized in that for the material (2) use is made of an amount of grains (4) which is encapsulated in coating material (7). 20
5. Method according to claim 1 or 2, characterized in that for the material (2) use is made of an amount of grains (4) which is enveloped by a coating (3) consisting of a membrane (8). 25
6. Method according to any of the above claims, characterized in that use is made of material (2) which has been gathered in the shape of a mat. 30
7. Method according to any of the above claims, characterized in that as the sealing is made, the material (2) is spread out and compressed before the hydration of the clay starts. 35
8. Method according to any of the above claims, characterized in that for the clay use is made of sodium bentonite. 40
9. Method according to any of claims 1 to 7, characterized in that for the clay use is made of calcium bentonite. 45
10. Element for realizing the method according to claim 1, characterized in that it mainly consists of an amount of material (2) on the basis of clay which has been provided with a temporarily liquid-resistant coating (3). 50
11. Element according to claim 10, characterized in that the coating (3) consists of a material which breaks down or dissolves in water. 55
12. Element according to claim 10 or 11, characterized in that the material (2) consists of grains (4) which are individually coated by means of a film (5).
13. Element according to claim 10 or 11, characterized in that the material (2) consists of an amount of grains (4) which is encapsulated in coating material (7).
14. Element according to claim 10 or 11, characterized in that the material (2) consists of an amount of grains (4) which is enveloped by a coating (3) consisting of a membrane (8).
15. Element according to any of claims 10 to 14, characterized in that the material (2) has been gathered in the shape of a mat.
16. Element according to claim 15, characterized in that this element (1) has at least one support (6) to which the material (2) has been applied.
17. Element according to any of claims 10 to 16, characterized in that the clay consists of sodium bentonite.
18. Element according to any of claims 10 to 16, characterized in that the clay consists of calcium bentonite.
19. Element according to any of claims 10 to 18, characterized in that the coating (3) consists of cellulose.



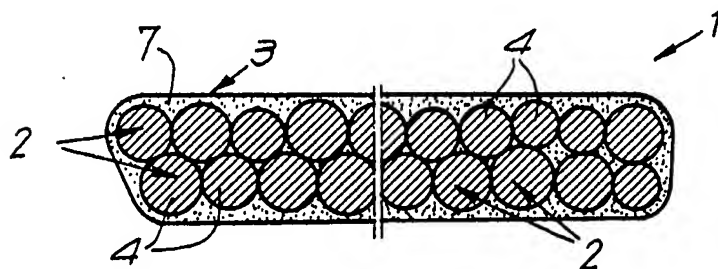
*Fig. 1*



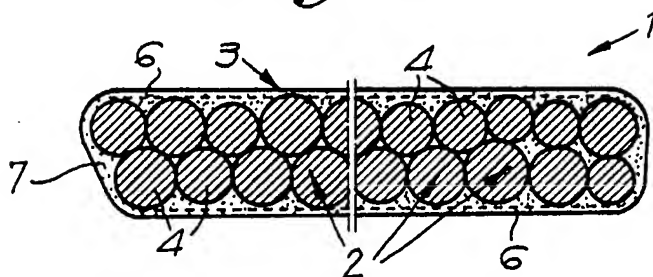
*Fig. 3*



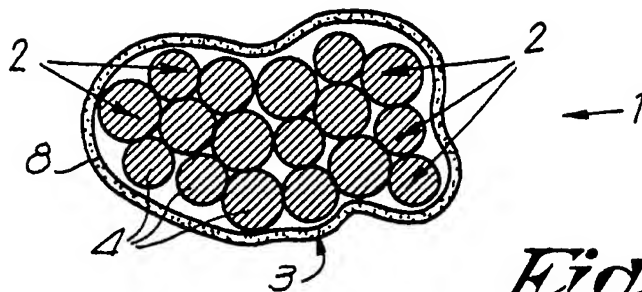
*Fig. 2*



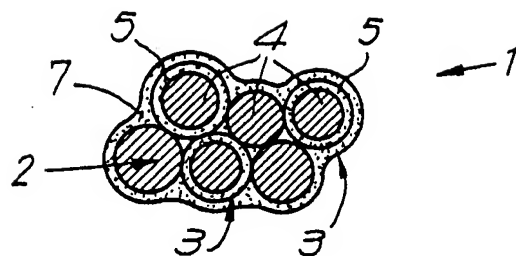
*Fig. 4*



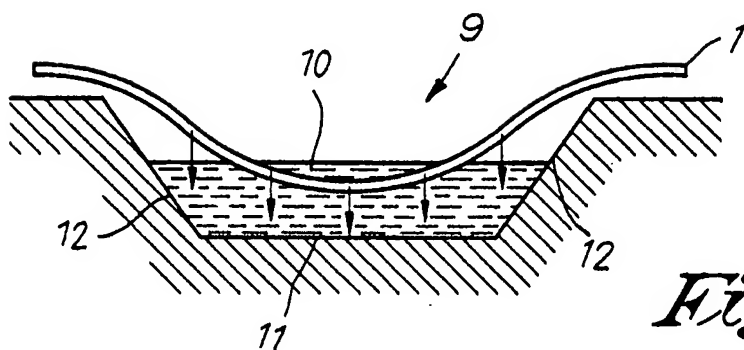
*Fig. 5*



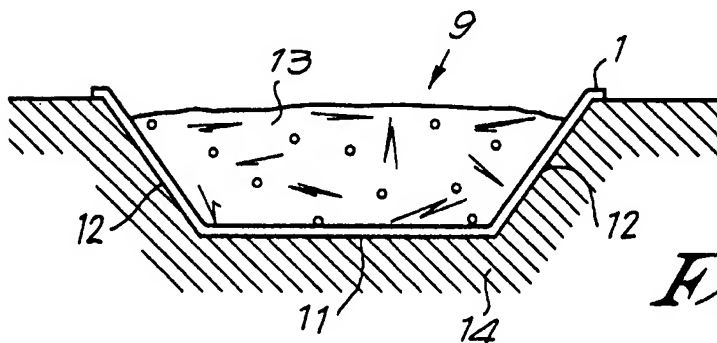
*Fig. 6*



*Fig. 7*



*Fig. 8*



*Fig. 9*



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## EUROPEAN SEARCH REPORT

Application Number

EP 92 20 2071

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-1 521 197 (AMERICAN COLLOID COMPANY)	1,2, 6-11, 15-19	E02D31/00
Y	* page 2, line 99 - page 3, line 41; figures 1-3 *	3,5,12, 14	
A	---	4,13	
Y	US-A-5 091 234 (MCGROARTY)	3,5,12, 14	
A	* column 2, line 13 - column 4, line 2; figures 1,2 *	1,6-9, 13,15-19	
A	---		
A	EP-A-0 059 625 (GEO-MAT INT.)		
A	WO-A-9 014 222 (PARAMOUNT TECHNICAL PRODUCTS)		
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			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E02D
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 02 JULY 1993	Examiner TELLEFSEN J.
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